

the chip for use in attaching cabling to the chip. Smith does not disclose or suggest that the bond pads are adherent by stiction to the surface of the chip (as pointed out in the specification, stiction is the tendency of two very clean surfaces to stick together). Nor does Smith disclose heating bond pads (19).

The Examiner suggests that Smith comprises a member (19) adherent by stiction to a surface of the substrate. As noted above, the Applicant submits that this is an improper characterization of Smith's bond pads. Smith does not mention that bond pads (19) are adherent by stiction to any surface of the substrate.

The Examiner also suggests that Smith discloses means for heating the member and refers to the abstract of Smith for this proposition. The abstract does indicate that the Smith device may include a temperature sensitive resistor (42) which can be used for measuring temperature. This temperature sensitive resistor is said to be mounted in the vicinity of the pressure sensitive resistor (41). Smith discloses various locations for temperature-sensitive resistor (42) including on diaphragm (15), on silicon substrate (13) or on a dummy diaphragm (col. 4, ln 38-54). Resistor (42) is located remotely from bond pads (19), as seen in Figure 3. It can be further appreciated from Figure 3 that temperature-sensitive resistor (42) is not disposed to heat any structure that is adhered by stiction to a surface.

Smith teaches that resistor (42) can function as a hot-wire anemometer to measure fluid flow. However, Smith does not teach or suggest using resistor (42) in pressure measurements. Indeed, Smith teaches away from this. Smith teaches that the reference resistance should be pressure independent (column 4, lines 51-52).

In light of the foregoing, the Applicant submits that it is clear that Smith completely lacks a number of features of the independent claims of this application, including:

- means for heating a member which is adherent by stiction to a surface and means for monitoring a temperature of that member (claim 1);
- an electrically conductive member in physical contact with a surface and electrically insulated from the surface wherein at least one of a surface of the electrically conductive member and a surface of the substrate has a surface roughness in the range of nanometers to tens of nanometers (claim 21);
- a member adherent by stiction to a surface of the substrate, a heater located to heat the member, and a temperature sensor located to generate a signal responsive to a temperature of the member (claim 30); or.

- an electrically conductive member in physical contact with a surface of a semiconductor wafer in which at least one of the surface and the member has an electrically insulating barrier which electrically isolates the electrically conductive member from the surface of the semiconductor wafer and at least one of a surface of the member and a surface of the substrate has a surface roughness in the range of nanometers to tens of nanometers (claim 41).

The Applicant submits that it would not be obvious to modify the Smith device to correspond with the claims of this application because Smith operates according to a completely different principle from the claimed pressure sensor. As noted above, Smith determines pressure by measuring deflections of a diaphragm.

Furthermore, the additional references cited by the Examiner fail to remedy the deficiencies of Smith.

The Examiner has indicated that Smith discloses "the surface of the member in contact with the substrate" and cites Smith's claim 31 which claims that "the pressure sensor and the temperature sensor are both mounted to said substrate". Neither this claim nor any other part of Smith discloses a member adherent by stiction as claimed. Further, Smith's diaphragm could not function as intended if it were adherent by stiction to the substrate as this would prevent the diaphragm from moving in response to pressure changes.

The Examiner has indicated that Smith discloses the member length claimed in claims 10 and 34. While Smith's bond pads (19) do have a size of 100 by 75 micrometers, these bond pads cannot be equated with the member claimed in any of claims 1, 21, 30 or 41. Bond pads (19) are not adherent to a substrate by stiction, as claimed. Furthermore, no mechanism is provided for heating the bond pads or measuring temperatures of the bond pads.

The Examiner has indicated that Smith discloses first and second pressure sensors, as claimed in claims 13-15 and 37. The Examiner refers to claims 1 to 3 of Smith. These claims fail to recite first and second pressure sensors. Only one pressure sensor (41) is mentioned. The claims to which the Examiner refers relate to an electrical circuit which can be configured as two different Wheatstone bridges, one for measuring temperature and one for measuring pressure.

The Examiner indicates that Fung discloses a bridge member (16) having a central collapsed portion. The Examiner refers to claim 1 of Fung for this proposition. The Applicant submits that this is an incorrect characterization of Fung.

As understood, Fung discloses a polysilicon diaphragm (14) supported across a gap in a substrate. Pressure differences across the diaphragm are measured by means of Piezoresistors (18) which are formed on the diaphragm. Nothing in Fung, including claim 1, teaches or suggests a central portion of diaphragm (14) being collapsed onto and adhering by stiction to a surface of a substrate, as claimed in claims 11 and 35. Indeed, if this occurred, the Fung device would be rendered inoperative as the diaphragm would not be free to respond to pressure differentials across it.

The Examiner indicates that Fung discloses plateaus (305), however, Fung does not use the reference numeral (305). The Applicant submits that Fung does not disclose plateaus underneath the member adherent by stiction to a substrate as claimed. Further, col. 3, ln. 30-64 to which the Examiner refers, fail to disclose or suggest a member adherent by stiction to plateaus and not in contact with valleys, as claimed in claim 17 of this application.

The Examiner asserts that one skilled in the art would combine the teachings of Smith to include the teachings of Gogoi et al. The alleged motivation is to improve the accuracy of capacitance. However, Smith does not teach a capacitance-based pressure measurement. Further, even if one did attempt such a combination, one would still not have the claimed invention. A person attempting to modify Smith to include the teachings of Gogoi et al. would not be lead to modify bond pads (19) in the manner suggested by the Examiner. A person seeking to modify Smith to include the teachings of Fung would also not be motivated to modify bond pads (19).

In light of the foregoing, the Applicant respectfully submits that claims 1 through 21 and 30 through 43 distinguish the prior art of record and are in condition for allowance.

Respectfully submitted,

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